

Application News

Life Science

Rapid Identification of Meat Species with the MCE-202 "MultiNA"

No. C297-E080

Use of the MCE-202 "MultiNA" in combination with the Ampdirect® reagent kit not only simplifies the pre-processing and detection operations in the identification of meat species, but also enables convenient, accurate and rapid identification of each species.

Introduction

With the increased concern over food safety and consumer awareness in recent years, there has been a demand for accurate, convenient, and rapid identification of the types of meat contained in meat food products. This need for meat species determination is met with the MCE-202 "MultiNA" DNA/RNA analyzer, which employs the multiplex PCR method.

Results

Five types of individual meat samples (chicken, beef, mutton, pork, horse) and samples containing mixtures of these were prepared. Then, without conducting DNA refinement, the Ampdirect® reagent was used and PCR was performed. Results of the analysis using the MCE-202 "MultiNA" are shown in Fig. 1. The fragments were clearly separated according to species, with 218bp from chicken, 268bp from beef, 331bp from mutton, 359bp from pork, and 430bp from horse. Fig. 2 shows the results of species identification in varying mixtures of three types of meat. Detection was possible even for individual meats comprising just 1% of the mixture. It is clear that multiple species of meat can be rapidly identified with a single analysis.

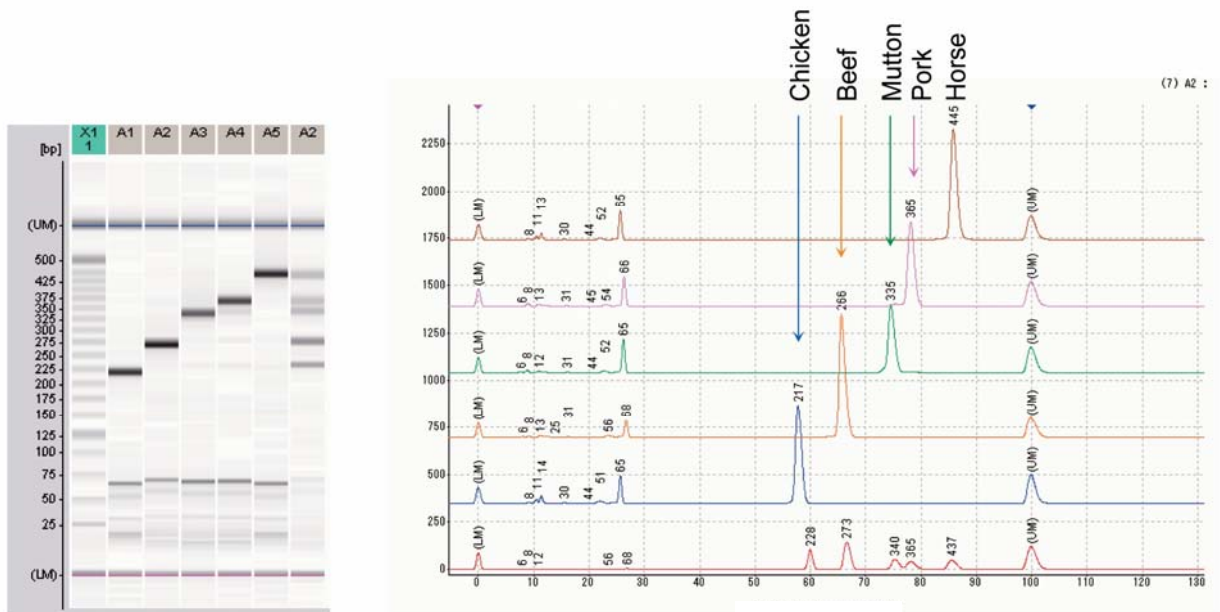


Fig. 1 Analytical results of multiplex PCR products of five meats amplified by Ampdirect® (MultiNA gel image and electropherogram)

Analytical Procedure

Analytical Instrument: MCE-202 "MultiNA"
Analysis Mode: DNA-500 Premix

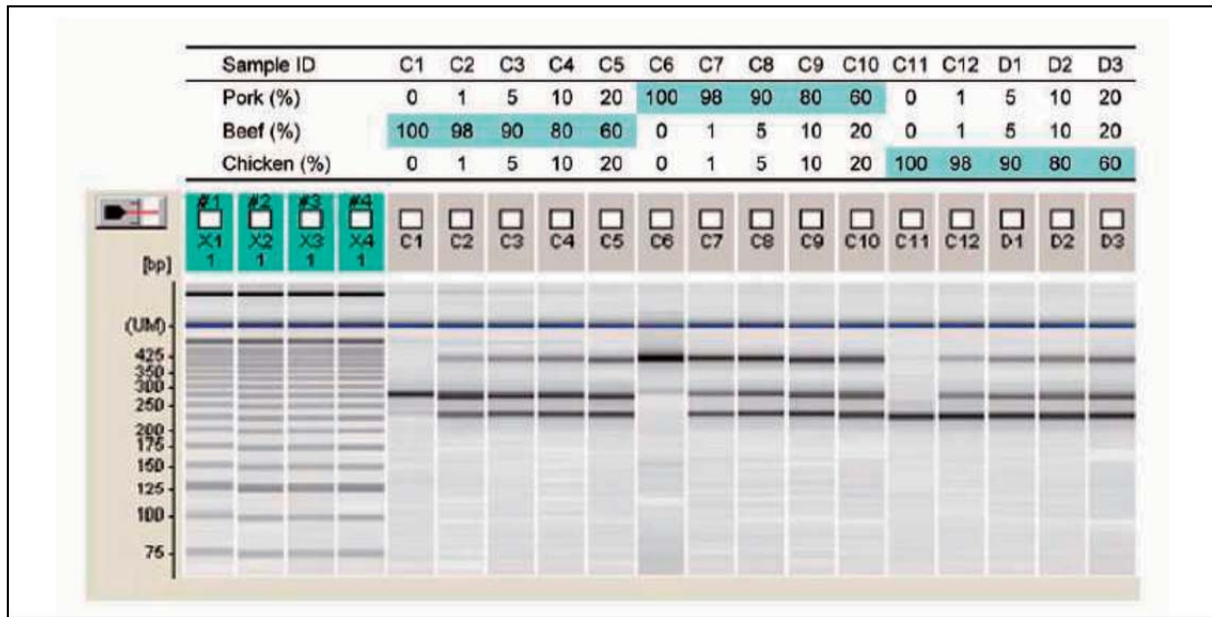


Fig. 2 Analytical Results of Multiplex PCR Products of Three Meats at Various Mixing Ratios

PCR Primer: Based on the paper of Matsunaga, et. al. (Journal of Japanese Food Science and Engineering, 46(3), 187, 1999), some modifications were made to the base array.

Reagents:

- Ampdirect®
- DNA-500 Reagent Kit for MultiNA (by Shimadzu Corporation)
- SYPR® Gold nucleic acid gel stain (by Invitrogen Corporation)
- 25bp DNA ladder (by Invitrogen Corporation)

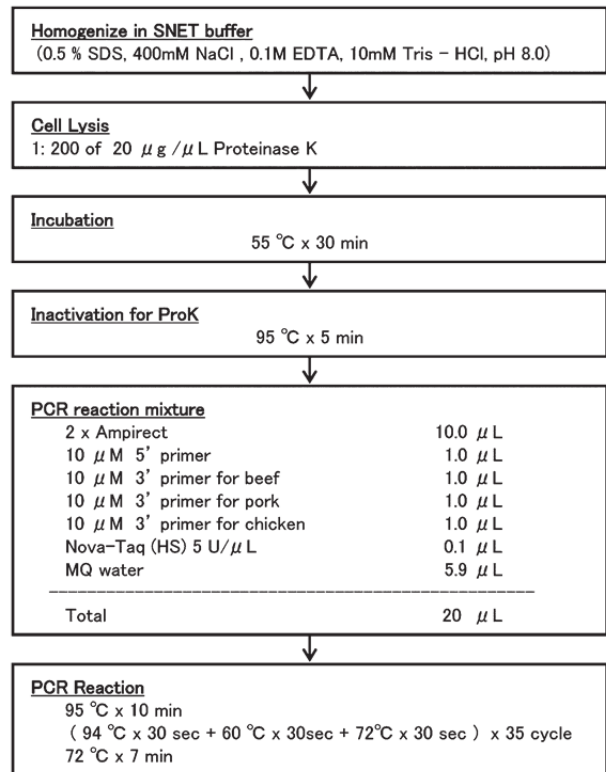


Fig. 3 Sample Preparation and Reaction Conditions